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7-20-2006

Restoring a Forest Watershed and Adding Water Back to the Land

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Abstracts of presentations given on Thursday, 20 July 2006, in session 30 of the UCOWR Conference.

Recommended Citation

Abercrombie, Dan C., "Restoring a Forest Watershed and Adding Water Back to the Land" (2006). 2006. Paper 6.
http://opensiuc.lib.siu.edu/ucowrconfs_2006/6

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RESTORING A FOREST WATERSHED AND ADDING WATER BACK TO THE LAND

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Historical evidence clearly shows a significant decline in both stream flow and ground water recharge in the Sacramento Mountains of southern New Mexico. Photos, oral history, early Census data, and written accounts all paint a much wetter picture than is present today. Dense forests are robbing springs and streams of surface flow. Ground water recharge during the recent drought was non-existent. Large numbers of wells all over Otero County dried up. Drilling deeper was successful in some areas, but people in some areas are still hauling water.

Members of the Sacramento River Watershed Coalition recently completed several large thinning projects near Timberon. Several thousand acres of Ponderosa pine and alligator juniper have been thinned and restored to historical tree densities. Trees were thinned on both private and State Land using Senator Jeff Bingaman's Forest Restoration funds, State Forestry Wildland/Urban Interface funds, NRCS Environmental Quality Incentive Program cost share, BLM, and the rancher's input. Tree densities were reduced to improve ground cover and reduce danger of a crown fire.

The Otero Soil and Water Conservation District began monitoring static water levels in five wells in the watershed about three years ago. Following the treatment and decent summer precipitation, water rose about 100 feet in a well below the treated area. The static water level in this well is now about 15 feet.

The New Mexico Bureau of Geology is preparing a Hydrogeology Map of the Sacramento Mountains.

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RESTORING A FOREST WATERSHED AND ADDING WATER BACK TO THE LAND

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Historical facts clearly show a significant decline in both stream flow and ground water recharge in the Sacramento Mountains of southern New Mexico. Photos, oral history, early Census data, and written accounts paint a different landscape than is present today. Dense forests are robbing springs and streams of surface flow. Ground water recharge during the recent drought was non-existent. Large numbers of wells all over Otero County dried up.

The Otero Soil and Water Conservation District served as the catalyst to form the Sacramento Watershed Coalition in 1996. The Natural Resources Conservation Service (NRCS), United States Forest Service (USFS), Bureau of Land Management (BLM), Otero County Commission, the home owner groups and landowners near Timberon joined with the District in developing a strategy for improving the watershed health.

The strategy developed revolved around applying for grants and coordinating implementation of projects. The Otero SWCD applied for 11 grants to thin trees and begin developing a data base of natural resources present in the area. In 2001, the first thinning project began and in 2003 the first grant was received for monitoring static water levels of selected wells in the watershed.

During the summer of 2004, the static water level in the southernmost well being monitored rose 70 feet.

SELECTED RECORDS FOR WATERSHED

General Land Office Survey notes from 1885 describing the Sacramento River area state that “the entire township is covered with a luxuriant growth of grass. Almost the entire township is covered with heavy timber of pine and fir of very good quality”. Indeed, many photos taken of the Sacramento Mountains in the early 1900’s depict an open forest with good grass cover.

The Department of the Interior carried out a firewood inventory for New Mexico in 1883 for the Tenth Census of the United States. There were 2-5 cords of firewood per acre available at higher elevations and 1-2 cords per acre in lower elevations of the pinon-juniper foothills.



OLD BENT MINE PICTURE TAKEN LOOKING NORTH IN ABOUT 1900 AND IN LATE 2005 PORTRAYS TREE DENSITIES AT ABOUT THE SAME ELEVATION AS THE LAND THINNED BELOW TIMBERON

In the early 1900's a water line was laid from the Sacramento River to Orogrande to supply water for the railroad. As late as 1971, the Sacramento River was stocked with fish at Timberon. Carrisa Spring, part of Timberon's water supply, has yielded as much as 600 gallons per minute. A 10-inch flow meter was installed on the main spring in 1986 and the average yield that year was 108 gpm. In the 1990's the flow ranged from 124 gpm in 1990 to a low of 66 gpm in 1994. Presently it is flowing about 30 gallons per minute.

Developers opened the Sacramento Mountains to large scale logging operations in the early 1900's. A railroad was built from Alamogordo to Cloudcroft and along many canyons such as in the Sacramento River watershed to transport the trees to saw mills. Settlers, at about the same time, brought large numbers of livestock, which kept the lush grasses of the forest floor short. Without the low intensity ground fires of the past, large numbers of tree seedlings sprouted and lived. The delicately balanced ecosystem early settlers marveled at, was forever changed. Trees began to overpower the natural balance developed between trees, grass, and water over the past centuries.

RESTORATION BEGINS

The Coalition's primary objective was thinning trees. Historic reconstruction of the forest plant communities painted a picture of a more open forest with many large openings or meadows. USFS logging records indicate a tree density of 20-70 trees per acre with 25-45 foot spacing.

Three Federal grant programs were found which fit these parameters. The owner of the Elkhorn Land and Cattle Company applied for an Environmental Quality Incentive Program cost share grant through the Natural Resources Conservation Service to thin trees on his private and State land. Elkhorn restored about 1800 acres of rangeland to a more natural tree density.



Photos depict thinning as part of a landscape with NRCS cost share program.

In 2001, the Otero SWCD successfully applied for a Collaborative Forest Restoration Program grant through the Community Forest Restoration Act of 2000. Three locations in the watershed were thinned. At Sunspot, 8 acres on the western slope below the National Solar Observatory were thinned. The Circle Cross Ranch thinned over 40 acres along the western boundary of Timberon. The Southern Cross Ranch thinned 337 acres south of Timberon.



These photos depict the west side of Timberon before Ponderosa Pine is thinned and after thinning with the CFRP grant.

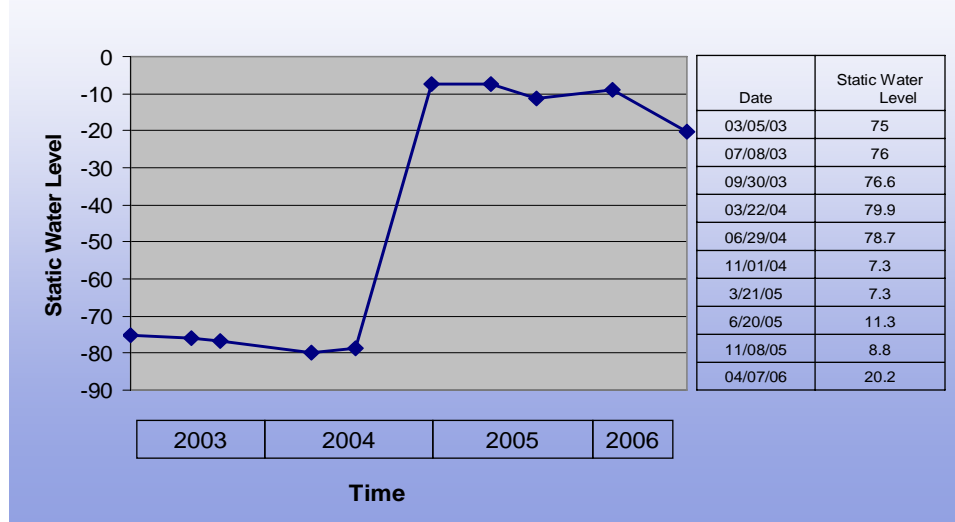
Timberon residents have completed 103 projects to thin 152 acres in Timberon. Project funding was received through the Western Wildland Urban Interface Program, which is part of the Happy Forest Act.

BLM used internal natural resource project funding to thin 230 acres of pinon-juniper slopes along the southwest side of Timberon to make Timberon more wildfire safe.

WATER

The Otero SWCD received small grants through the Bureau of Reclamation to monitor the Static water levels in 6 wells in the watershed. Water level data has been collected since 2003.

Static Water Levels Southern Cross Well



The graph portrays a dramatic rise in the water table at the lower well being monitored. This well is located in an east-west syncline or downfold in the San Andreas Limestone formation.

The Otero SWCD petitioned the 2004-2005 and 2005-2006 New Mexico State Legislatures for funds to complete some hydro-geologic mapping in the Sacramento Mountains. The Otero SWCD has been working on a plan with the Bureau of Geology to gain a better understanding of the water cycle in the Sacramento Mountains. Several years of mapping geology and data collection will provide facts so that land managers can use better science to make watershed management decisions.

CONCLUSIONS

Almost 3000 acres have been restored to a more natural tree density through the efforts of this Coalition. The wildland-urban interface initiative and Environmental Quality Incentive Program were the tools that led to the number of acres thinned contiguously. Ponderosa Pine roots extend 75-125 feet deep and juniper roots extend up to 200 feet deep. Reducing the consumptive use of the forest by thinning and restoring savannahs to the landscape apparently affected the water cycle. Landscape thinning during the present drought cycle produced a dramatic rise in the water table below the thinning.

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